



Interreg
North Sea Region
IMMERSE

European Regional Development Fund



EUROPEAN UNION

The IMMERSE project: approach and results

Frederik Roose (MOW)

IMMERSE Key info

“IMplementing MEasuRes for Sustainable Estuaries”

- + October 2018 – March 2023
- + 11 partners, 6 countries
- + Total budget: 4,5 M euro

<http://northsearegion.eu/immerse/>

Interreg VB North Sea Region
programme

- + Priority 3: Sustainable North Sea Region
- + ERDF co-financing: 50%

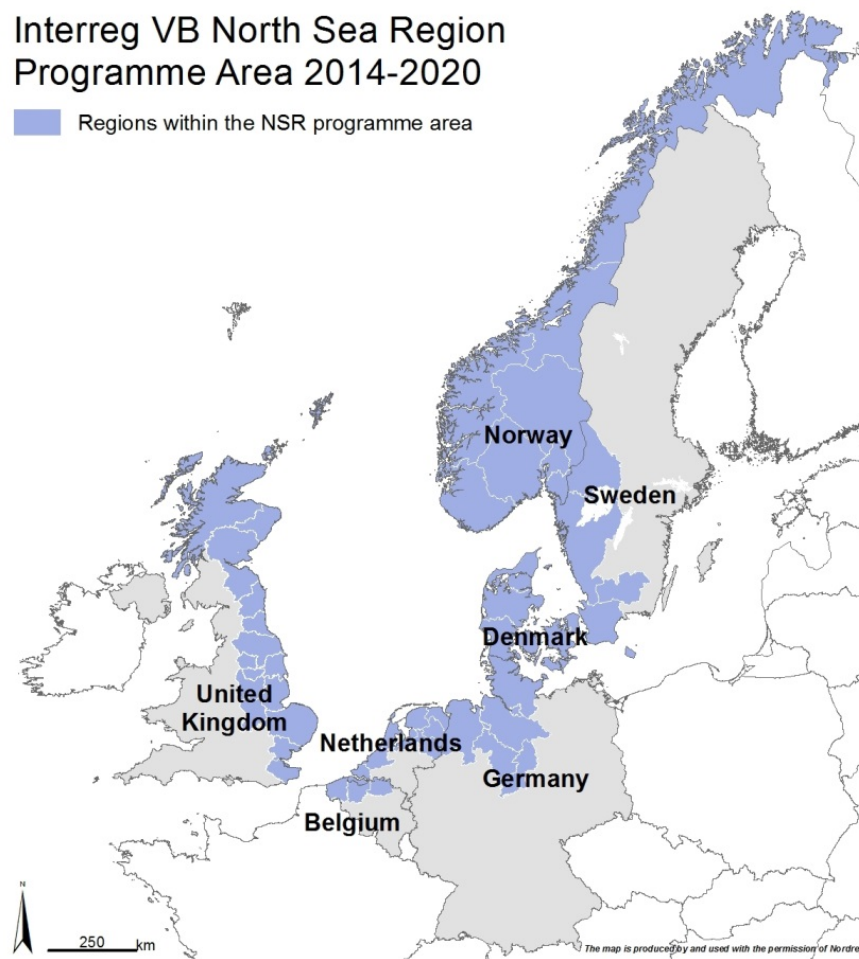


@IMMERSE_NSR

IMMERSE Partnership

Interreg VB North Sea Region
Programme Area 2014-2020

Regions within the NSR programme area



+ UK

- + University of Hull
- + Tees River Trust

+ Flanders, Belgium

- + Mobility and Public Works
- + De Vlaamse Waterweg
- + Port of Antwerp

+ The Netherlands

- + Rijkswaterstaat

+ Sweden

- + Chalmers University of Technology

+ Denmark

- + Holbæk Municipality
- + Sweco

+ Germany

- + Hamburg Port Authority
- + Bundesanstalt für Wasserbau

Common ground

- + Estuary managers
- + Knowledge institutes (working for estuary managers)
- + Management issues
- + Develop and implement measures
- + Stakeholders
- + Exchange knowledge and experiences

IMMERSE: objective and results

Project objective:

Improve the design, testing and implementation of estuary management measures by using transnational knowledge and stimulating stakeholder integration

Expected results:

1. Increased potential delivery of measure benefits, resulting from advances in measure development during the project
2. Increased stakeholder acceptance of measure designs and subsequent implementation


IMMERSE project results

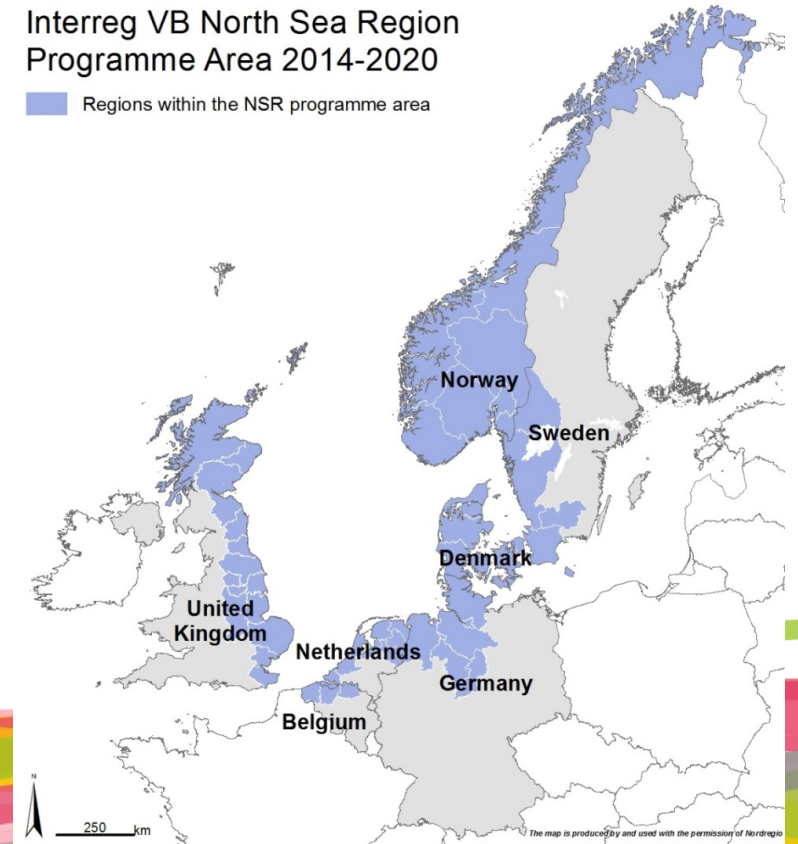
IMMERSE contributes to the capacity of North Sea region to improve the quality of the environment by:

- + reducing negative impacts
- + repairing past damage, and/or
- + promoting ecosystem services and biodiversity

'Joining efforts to lead the way to stronger, more sustainable economies and societies around the North Sea.'

Interreg VB North Sea Region
Programme Area 2014-2020

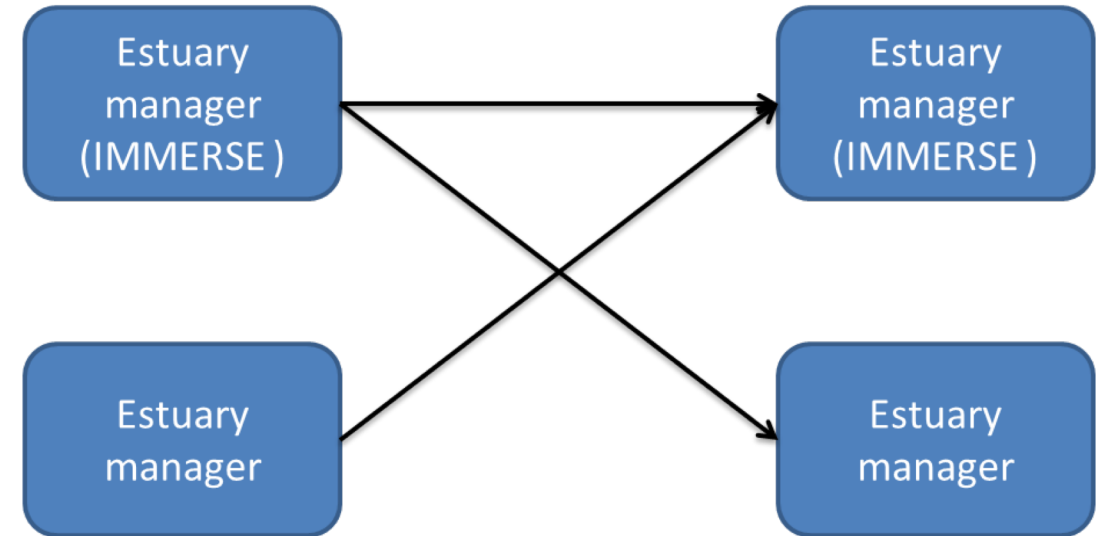
 Regions within the NSR programme area



IMMERSE Activities

- + Development of management measures (WP 3-5)
- + Governance (WP 6)
- + **Transnational exchange (WP 7)**

Transfer of knowledge

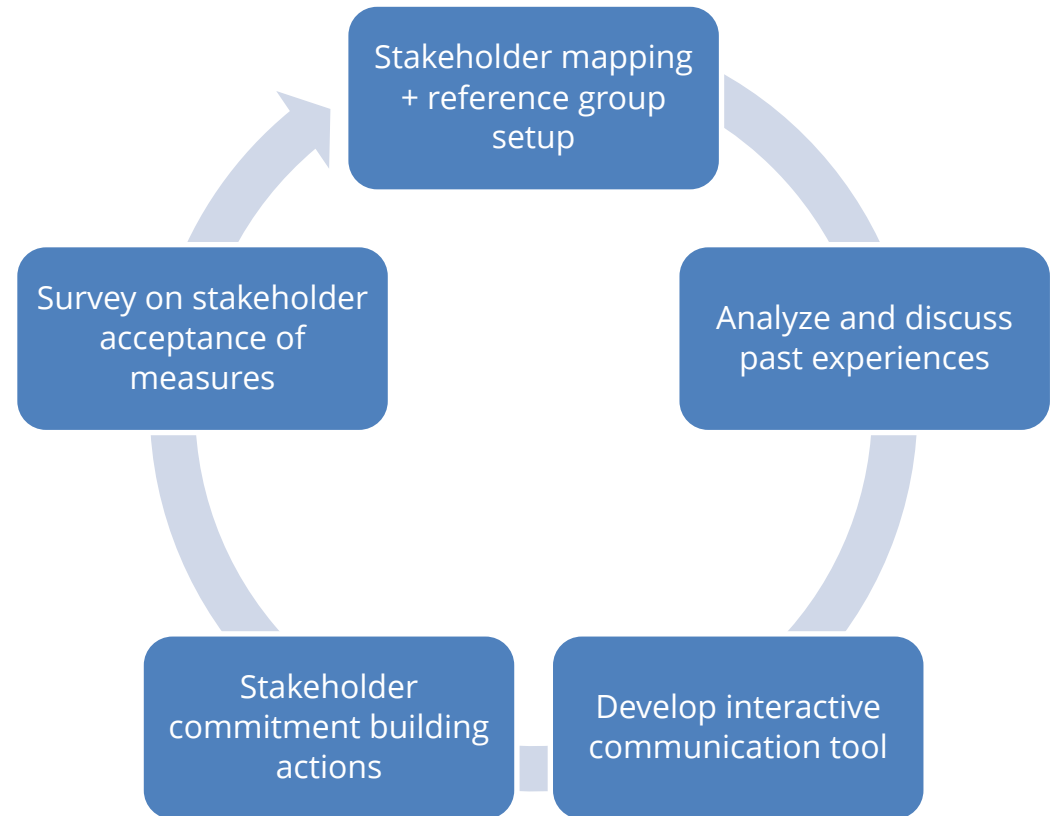


“Transnational Estuary Exchange Labs” (TEEL)

→ provide a platform to share practices and progress on the development of solutions for estuarine management issues.

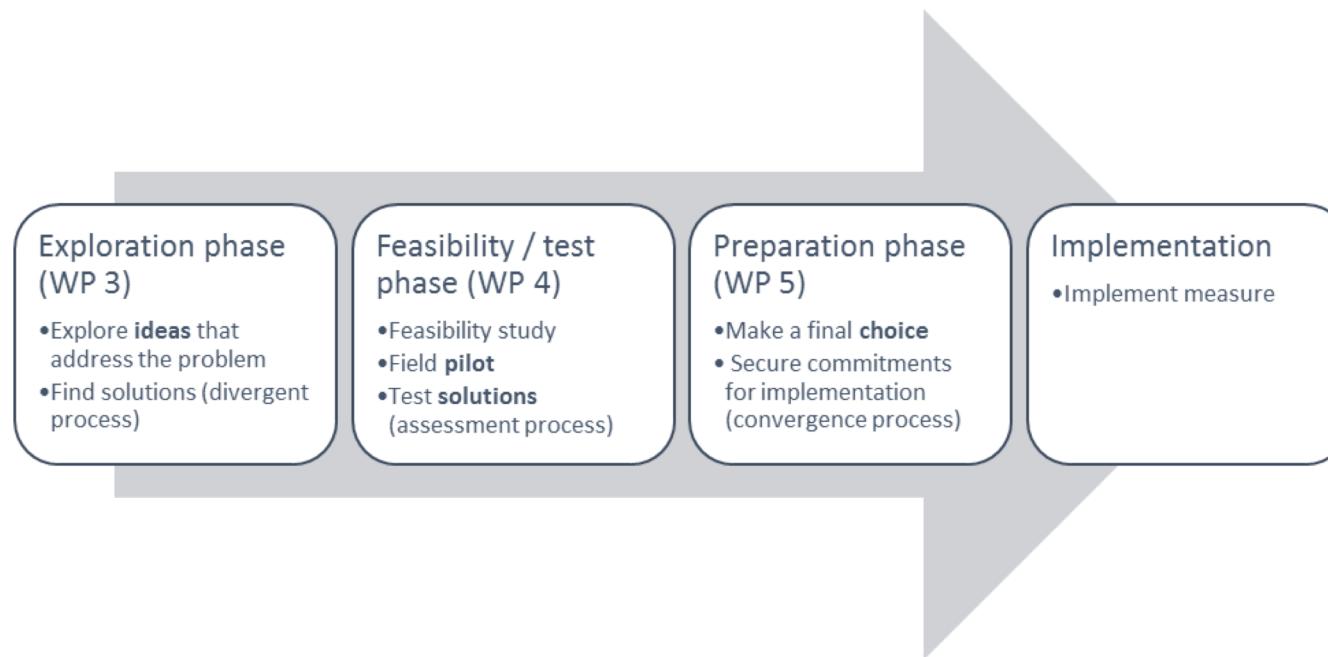
IMMERSE Activities

- + Development of management measures (WP 3-5)
- + **Governance (WP 6)**

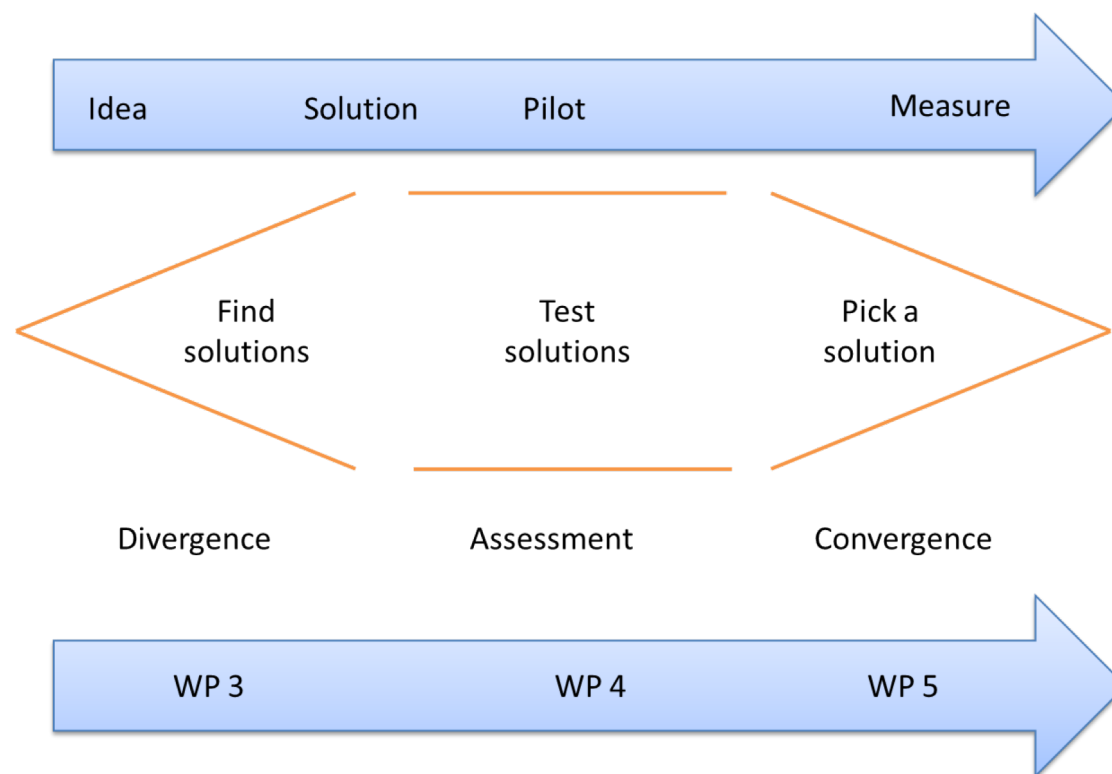


IMMERSE Activities

+ Development of management measures (WP 3-5)



Development of solutions



Development of solutions

Exploration



Assessment

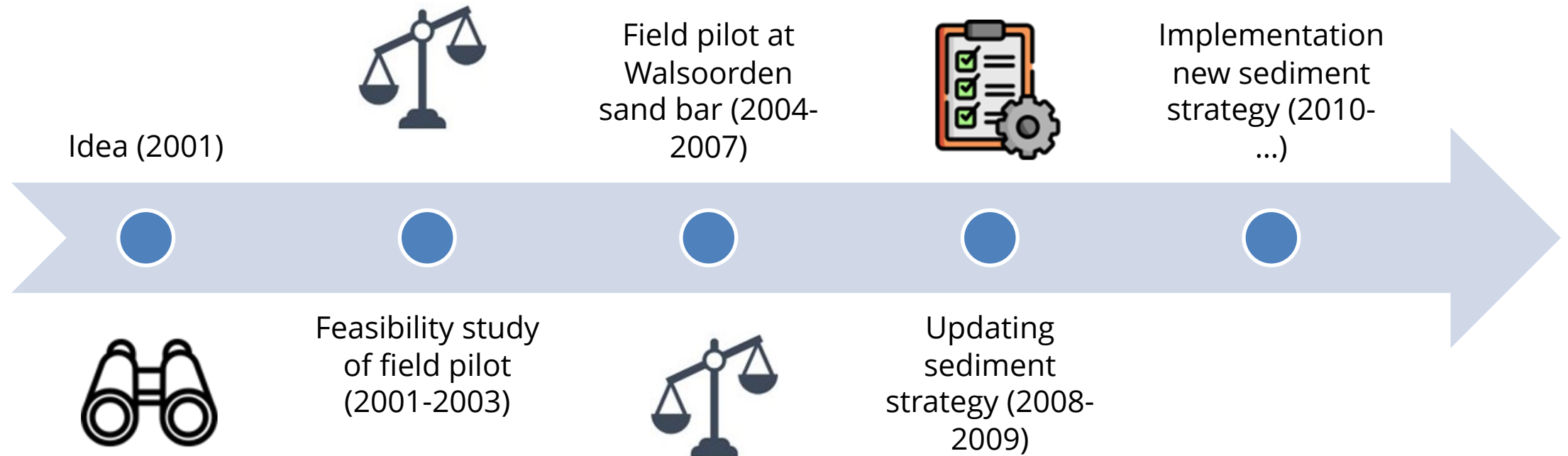


Preparation

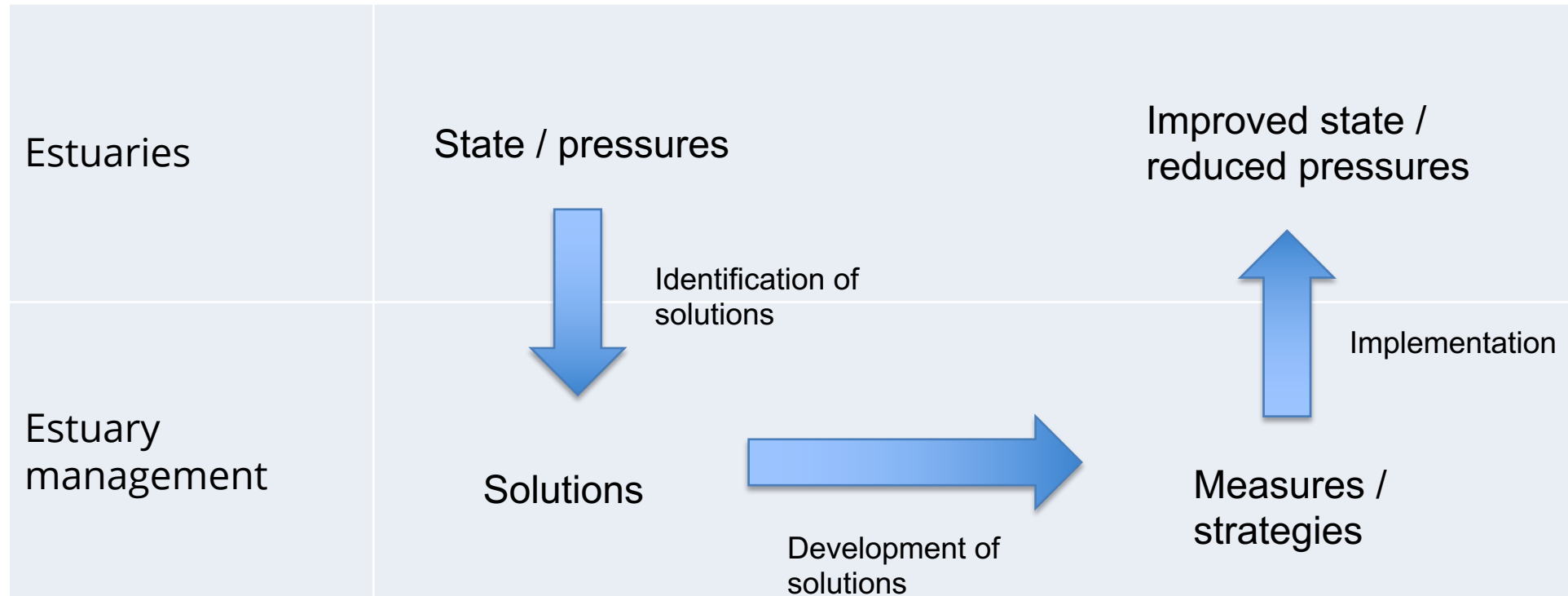


Implementation

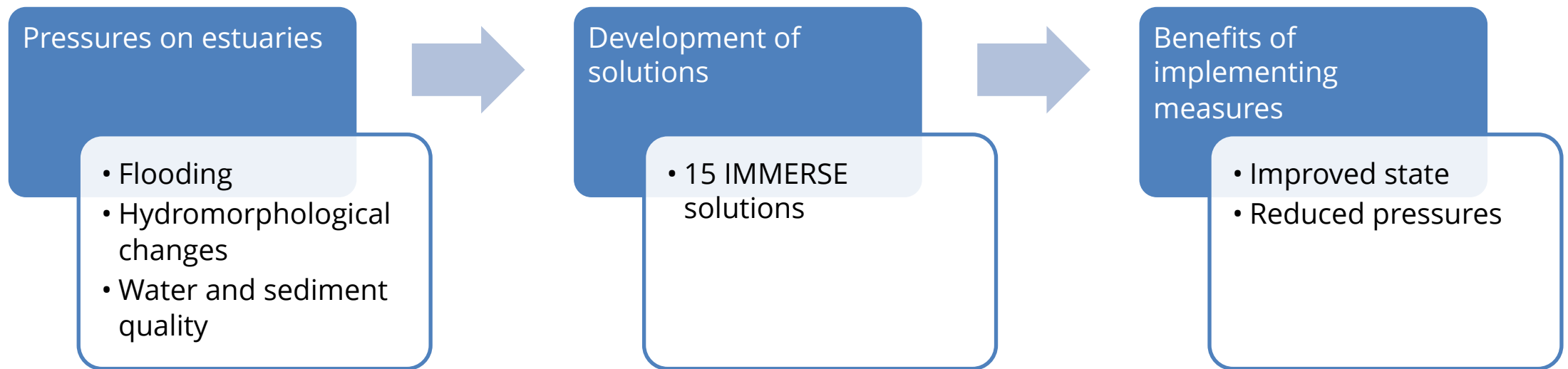
Example: relocation of sediment to sandbars (Westerschelde)



Impact of IMMERSE solutions

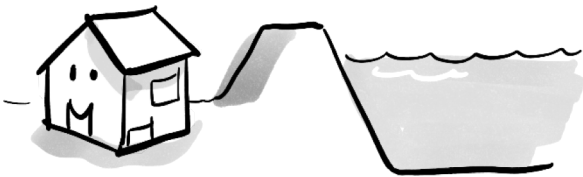


Impact of IMMERSE solutions





IMMERSE Solutions for flooding



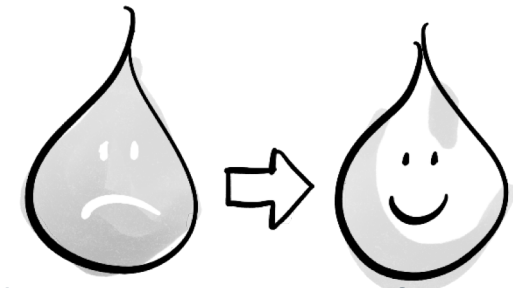
ESTUARY	SOLUTION	DEVELOPMENT PHASE
Humber	Design measures for flood risk management while maintaining/enhancing environmental protection measures	Exploration
Holbækfjord	Improve understanding of contributing role of local waterways to flooding	Exploration
Humber	Testlab: proof of concept test for measures (lab testing)	Assessment
Scheldt	Explore solutions as part of a sediment strategy to adapt to the effects of climate change and sea level rise in the Scheldt estuary	Exploration
Isefjord	Analysis, design and environmental assessment of a dynamic flood protection measure	Exploration





IMMERSE Solutions for hydromorphological changes

ESTUARY	SOLUTION	DEVELOPMENT PHASE
Scheldt	Develop a morphological management strategy	Exploration
Elbe	Assess adapted sediment management through use of numerical modelling & feasibility study on the reconnection of the Dove-Elbe	Assessment
Scheldt	Pilot on cross-border solutions for maintenance dredging	Assessment
Tees	Pilot on intertidal habitat creation	Assessment
Scheldt	Execute measure to reduce tidal intrusion and increase nature value	Preparation



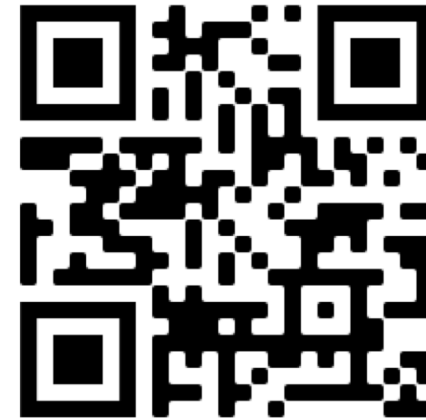
IMMERSE Solutions for water and sediment quality

ESTUARY	SOLUTION	DEVELOPMENT PHASE
Tees	Improve water quality and economic stimulus through co-location of mariculture with inshore windfarm	Exploration
Göta älv	Develop innovative rain gardens to filter and degrade microplastics	Assessment
Humber	Quantify the potential to use biological agents to filter microplastics from the water column within the Humber	Assessment
Göta älv	Design solutions for managing contaminated sediments, including assessing existing pilot on stabilisation/solidification of dredged masses and develop method for recovery of metals and polluted sediments	Exploration
Elbe	Mapping the state of sediment-bound contamination in the Elbe estuary	Exploration

Discover 15 IMMERSE solutions

- + Web based
- + Interactively
- + Visual platform
- + Animations
- + Explanation
- + Maps

ArcGIS StoryMaps: <https://arcg.is/05H0nH>





Verzameling

IMMERSE Project

Implementing MEasures for Sustainable
Estuaries

Aan de slag



1 IMMERSE



2 Pressures



3 Danish fjords



4 Elbe Estuary



5 Göta Estuary



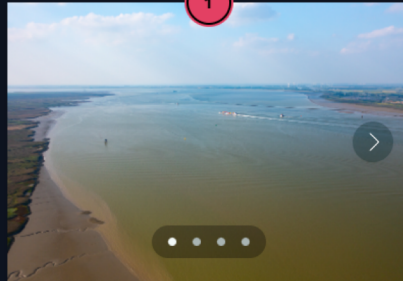
6 Humber Estuary



7 Scheldt Estuary



8 Tees Estuary



The Scheldt (BE/NL)

Pressures

Tidal amplification and Flooding

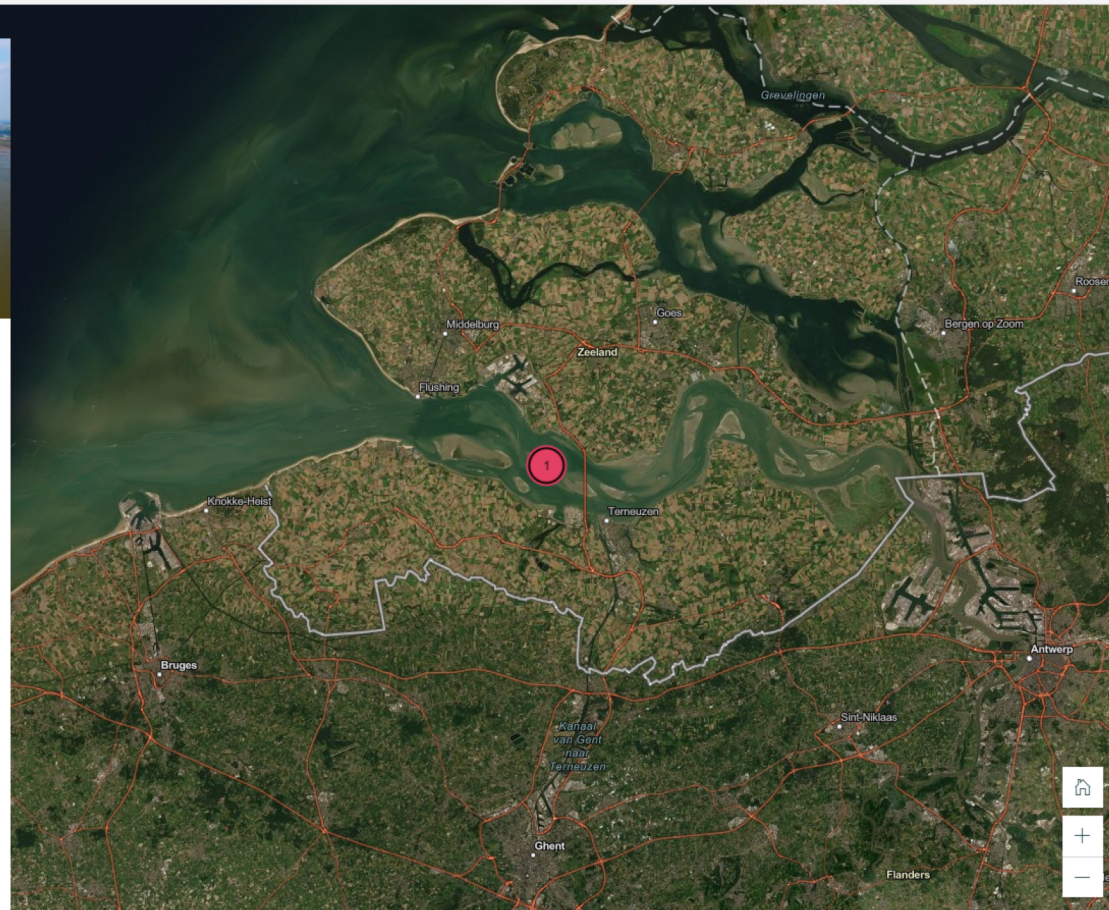
Solutions

Sediment Management to maintain port accessibility, improve the safety against flooding and develop ecological valuable habitat areas

Adapting to climate change

Cross-border sediment relocation pilot

Widening the Scheldt to reduce tidal





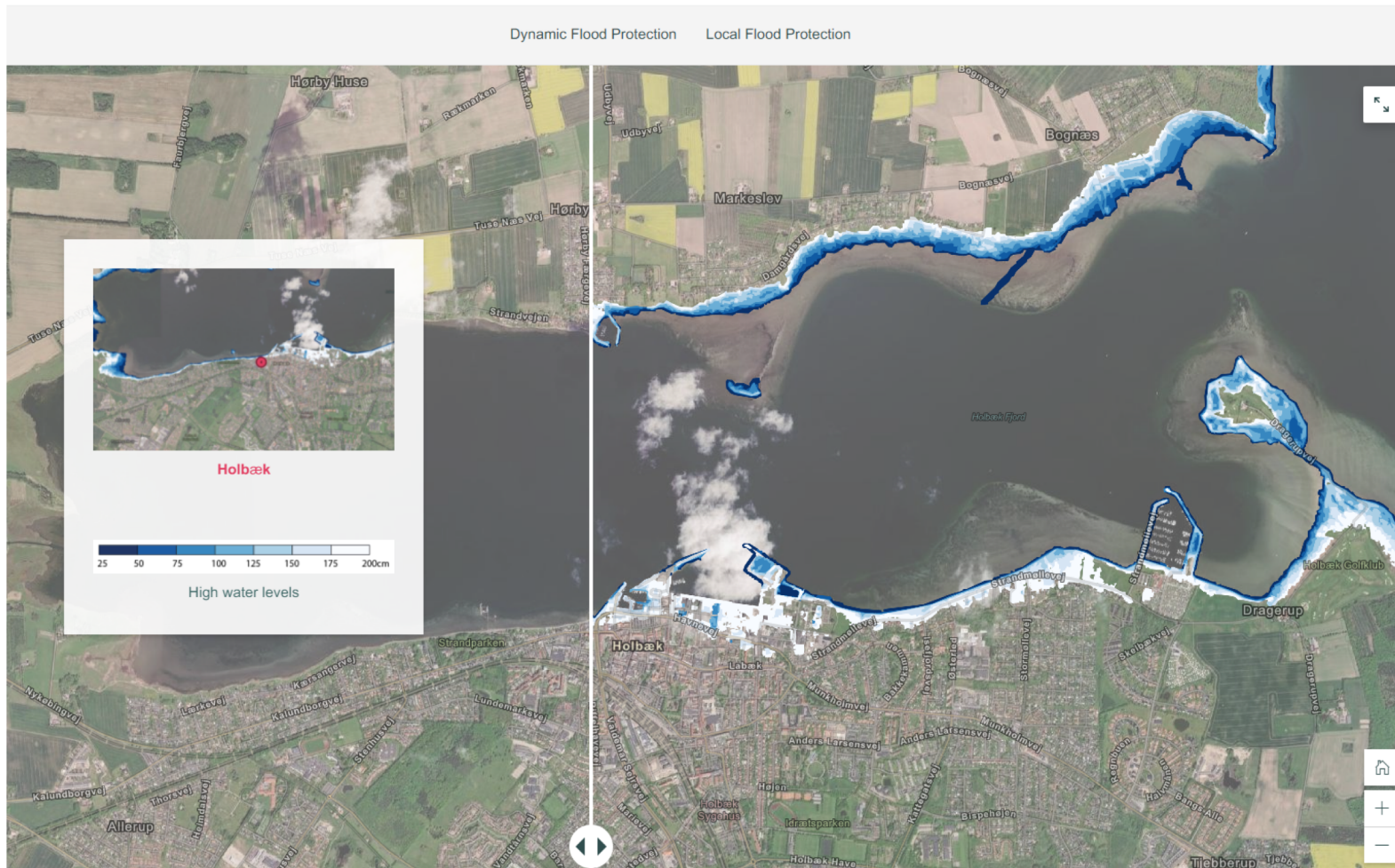
Flooding Habitat loss Tidal Amplification Pollution

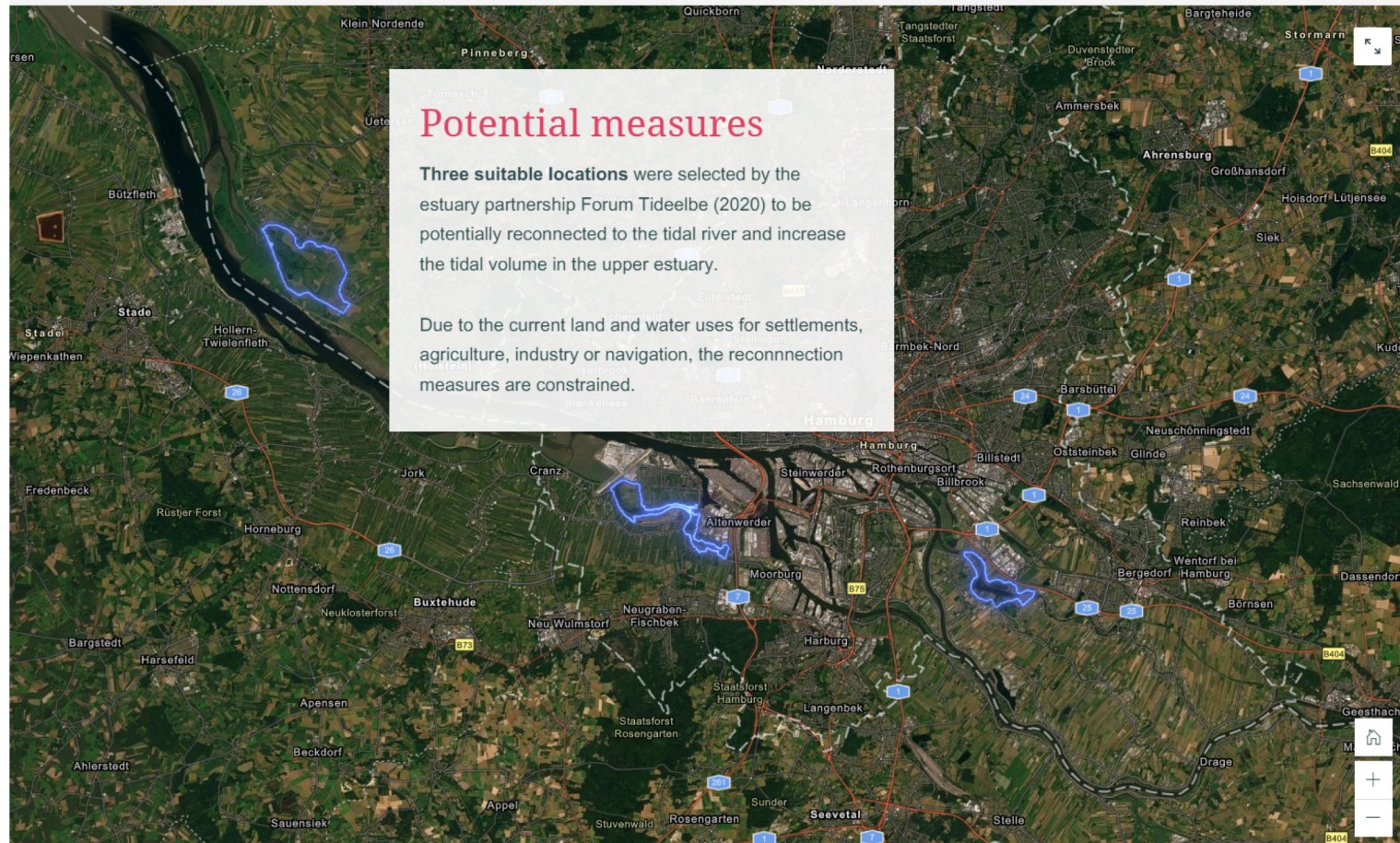
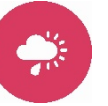




IMMERSE Project

← 03 / 08 →







Sediment pollution

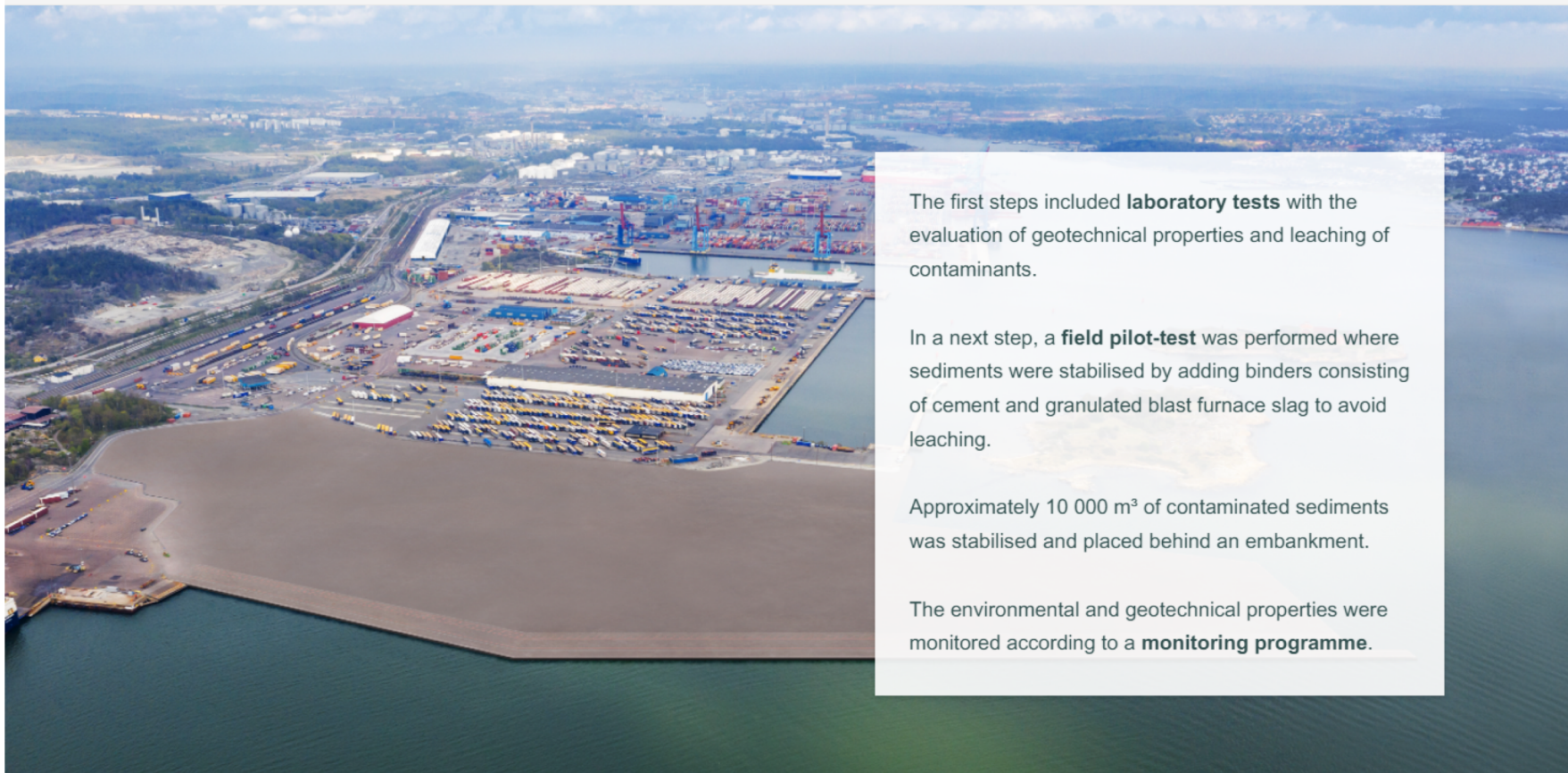
Dredging

Conventional management

Alternative management options

Use of sediments

Microplastics

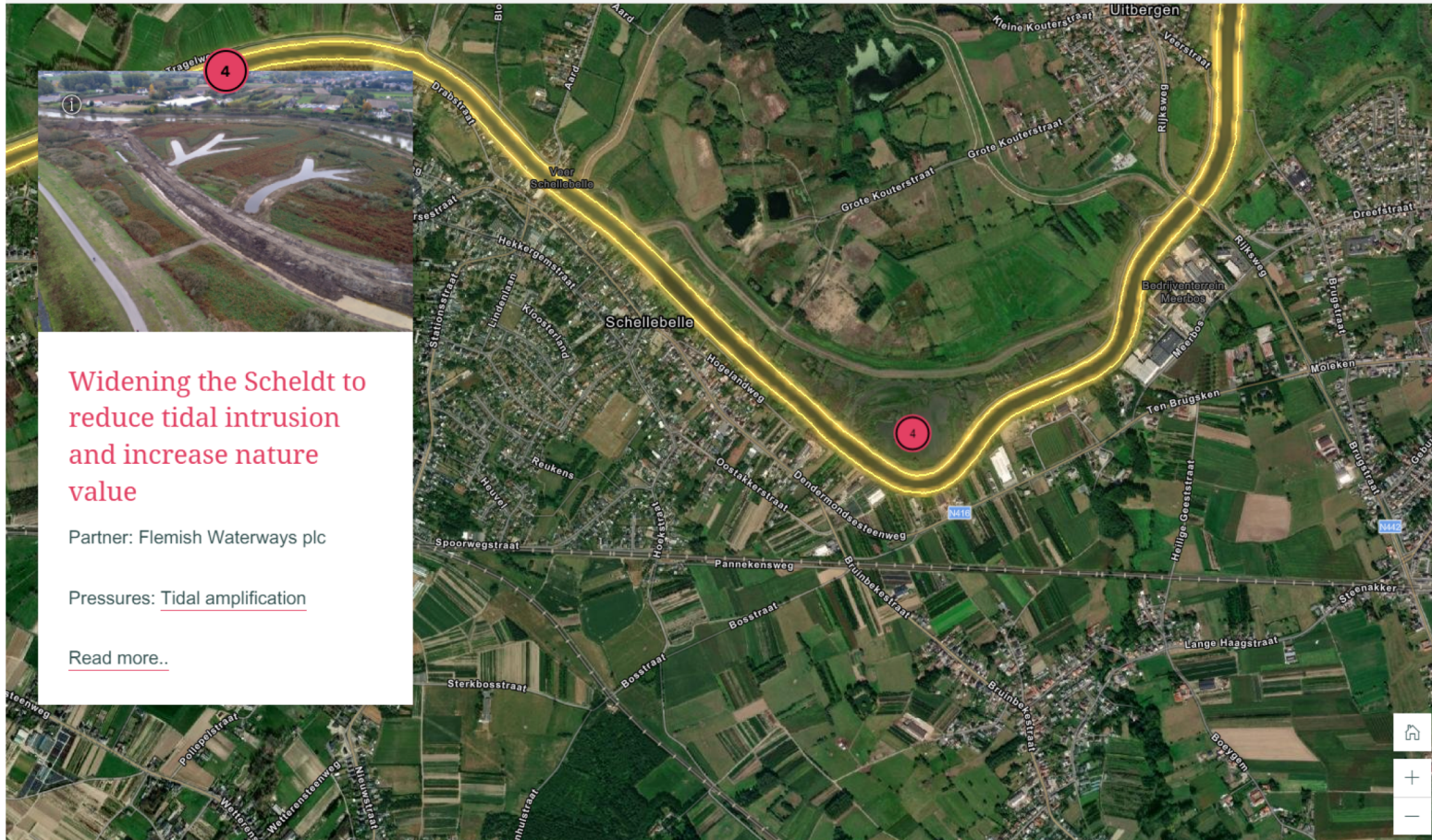


The first steps included **laboratory tests** with the evaluation of geotechnical properties and leaching of contaminants.

In a next step, a **field pilot-test** was performed where sediments were stabilised by adding binders consisting of cement and granulated blast furnace slag to avoid leaching.

Approximately 10 000 m³ of contaminated sediments was stabilised and placed behind an embankment.

The environmental and geotechnical properties were monitored according to a **monitoring programme**.



Widening the Scheldt to reduce tidal intrusion and increase nature value

Partner: Flemish Waterways plc

Pressures: Tidal amplification

[Read more..](#)



IMMERSE Project

← 08 / 08 →



Inshore Windfarm

Tees Estuary Edges

[Read more..](#)

2



Intertidal habitat creation

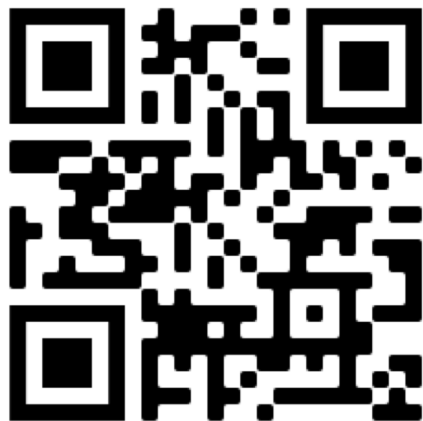
Pressure: habitat loss

[Read more..](#)



IMMERSE Overall project results

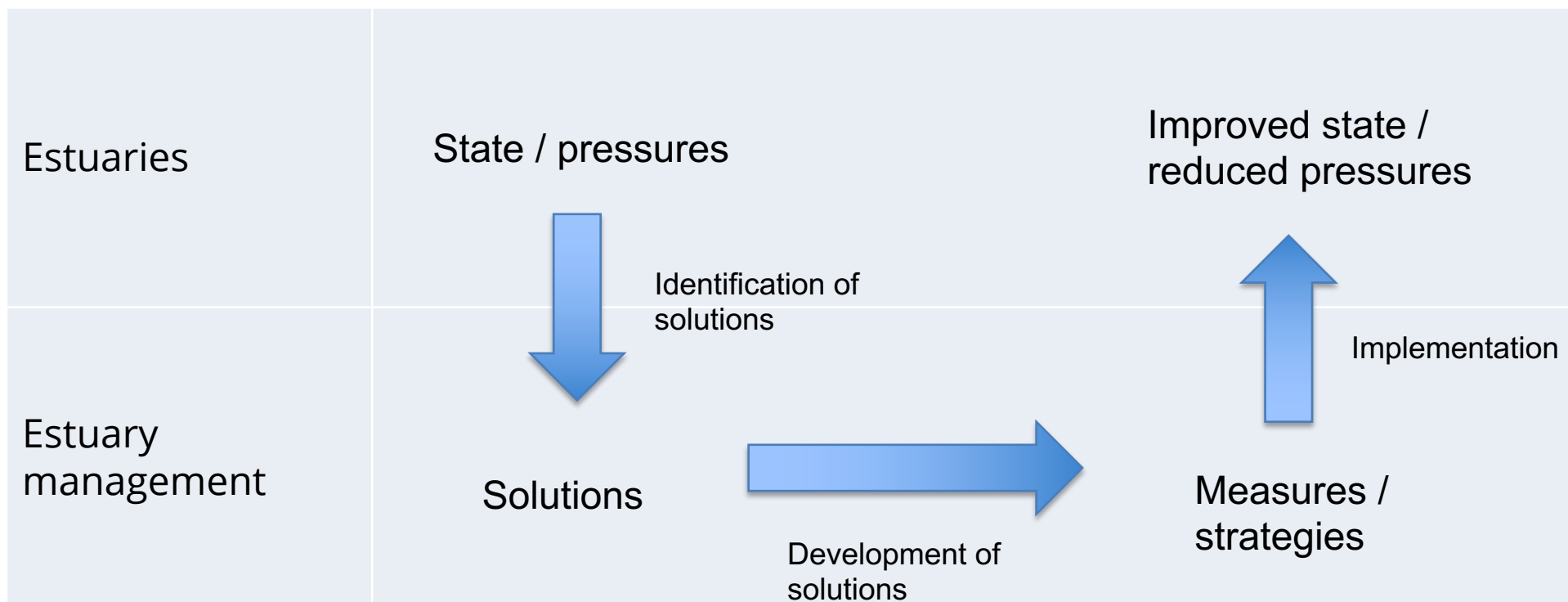
+ ArcGIS StoryMaps:
<https://arcg.is/05H0nH>



+ Summary report



Impact of IMMERSE solutions



Implementing MEasuRes for Sustainable Estuaries

